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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,954	06/27/2005	Kari Saviharju	JHN-30-574	8619

23117 7590 08/11/2008
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EXAMINER	
RINEHART, KENNETH	
ART UNIT	PAPER NUMBER
3749	
MAIL DATE	DELIVERY MODE
08/11/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/516,954	SAVIHARJU ET AL.	
	Examiner	Art Unit	
	Kenneth B. Rinehart	3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5,7-12,14-16,18-30 and 32-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5,7-12,14,15,18-30 and 32-34* is/are rejected.

7)☒ Claim(s) *16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 6/30/08 have been fully considered but they are not persuasive. Regarding applicant's comments concerning '690 the figures and spec clearly show the same circulating system. Regarding the applicant's comments concerning water cooled walls, as superheaters heat up a fluid, the fluid would inherently cool the cavity. Regarding the applicant's arguments concerning Ham and Olausson, the applicant is arguing against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 32 and 34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 32 and 34 refer to combustion gases from the cavity mix in the narrow section with flue gases passing through the narrow section which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 32, 34 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 92/18690. WO 92/18690 discloses a boiler including walls defining a furnace and a flue gas passage (fig. 1), at least one liquor injector (40) arranged to inject liquor into the furnace, and at least one superheater (15) arranged in the flue gas passage for combustion gases generated in the furnace and flowing through the flue gas passage ; water cooled tubes arranged in at least one of the walls defining the furnace (page 13, lines 27-30); a combustion cavity (22)separate from the furnace and having a cavity wall formed of water cooled tubes (72); a fuel combustor arranged in the at least one cavity (end of 62); a cavity combustion gas outlet discharging combustion gases from the cavity to the boiler (arrow above 51), wherein the combustion gas outlet is proximate a narrow section of the flue gas passage and the combustion gases from the cavity mix in the narrow section with flue gases passing through the narrow section (This mixing will inherently occur when the combustion gases pass around superheating surface.), the water cooled tubes of the cavity wall are in fluid communication with the water cooled tubes in the walls defining the furnace (72,74,51), and the system including: a superheater (51) in the furnace generating superheated steam, and a cavity heat exchanger (72) receiving superheated steam from the superheaters in the furnace.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5, 7-9, 19-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 92/18690 in view of Engstrom (4676177). WO 92/18690 discloses a boiler further comprising a water or steam circulation system having superheaters and a furnace for recovering energy and chemicals from spent liquor combusted in the furnace (18, 51, fig. 1); walls of the boiler further comprising a plurality of water cooled tubes in fluid communication with the water or steam circulation system, water cooled tubes, cooling fluid (page 13, lines 27-30); at least one cavity (22) separate from the boiler, said cavity having cavity walls formed of water cooled tubes (72) in fluid communication with the water cooled tubes (51,48,50) in at least one of the walls of the boiler (18) and the water or steam circulation system (fig. 1); a fuel combustor arranged in the at least one cavity (end of 62, fig. 1); at least one outlet for discharging combustion gases from the cavity to the boiler (arrow above 51, fig. 1), and an interior of the at least one cavity having a cavity heat exchanger for superheating steam generated by superheaters in the boiler (72, fig. 1), a part of the walls of the at least one cavity is formed of the water cooled tubes of the boiler (72, fig. 1), the at least one cavity is located on a front wall of the boiler, and the front wall is the at least one of the walls of the boiler (18, fig. 1), the at least one outlet of the cavity is in a front wall of the boiler and said outlet is opposite to a bullnose section of a rear wall of the boiler (fig. 1), the at least one outlet for the cavity is connected to the boiler and provides a conduit for combustion gases from the at least one cavity to be discharged immediately upstream

of the superheaters of the boiler (fig. 1), a boiler further comprising at least one wall defining a furnace (18, fig. 1), at least one liquor injector arranged to inject liquor into the furnace (40, fig. 1), and at least one superheater arranged in a flue gas passage for combustion gases generated in the furnace (51, fig. 1), a plurality of water cooled tubes arranged in the at least one wall defining the furnace (page 13, lines 27-30); at least one cavity separate from the furnace and having walls formed of water cooled tubes (72, fig. 1), wherein fluid flowing through at least one of the water cooled tubes of the at least one wall defining the furnace flows through at least one of the water cooled tubes of the cavity and flows to the at least one superheater (page 13, lines 27-30); a fuel combustor arranged in the at least one cavity (end of 62, fig. 1); at least one outlet of the cavity for discharging combustion gases from the cavity to the boiler (arrow above 51, fig. 1), and an interior of the at least one cavity being provided with a heat exchanger which receives superheated steam from the at least one superheater (72, fig. 1), the liquor injector discharges spent liquor into the furnace (40, fig. 1), the at least one superheater is a plurality of superheaters arranged in a flue gas stream of the boiler (51, surfaces, fig. 1), a part of the walls of the at least one cavity is formed of the water cooled tubes of the walls of the boiler (72, fig. 1), the at least one cavity is located on a front wall of the boiler (22, fig. 1), the at least one outlet for combustion gases is connected to the boiler and provides a conduit for combustion gases from the at least one cavity to be discharged immediately upstream of the superheaters of the boiler (fig. 1), the outlet of the cavity is in a front wall of the boiler and said outlet is opposite to a bullnose section of a rear wall of the boiler (fig. 1), a gasifier for gasifying a biomass material and said gasifier produces combustion gas provided to the fuel combustor of the cavity (14, 16, fig. 1), the cavity is adjacent an outside surface of the at least one wall of the furnace (fig. 1),

injecting spent liquor in the furnace to generate hot combustion flue gases in the furnace (40, fig. 1), cooling the at least one wall of the furnace by flowing cooling fluid through the wall (page 13, lines 27-30), generating hot combustion gases in the cavity (fig. 1); cooling a cavity wall of the cavity by flowing cooling fluid from the at least one wall of the furnace through the cavity wall (page 13, lines 27-30),; and passing cooling fluid from the wall of the cavity to a superheater arranged in a flue gas passage of the boiler (page 13, lines 27-30), the hot combustion gases in the cavity are discharged into the boiler upstream of the superheater (fig. 1), comprising passing fluid from the superheater in the gas passage of the boiler to a heat exchanger in the cavity (page 13, lines 27-30), the cooling fluid flows vertically upward through the wall of the furnace and then to the cavity (51, 74, fig. 1), the combustion gases in the cavity are generated by combustion gases generated in a gasifier that gasifies a biomass material, the biomass material is selected from a group consisting of natural gas, LPG, oil, methanol and liquefied biomass, a gasifier for gasifying biomass material and said gasifier produces combustion gas provided to the fuel combustor of the cavity (abstract, 16, fig. 1), passing fluid from the superheater in the gas passage of the boiler to a heat exchanger in the cavity (fig. 1, (page 13, lines 27-30). Engstrom teaches at least a portion of the … of the cavity walls is formed of the … of the at least one of the walls of the boiler, the cavity wall … is at least partially formed of the wall of the boiler, the cavity wall is at least partially formed of the at least one wall of the furnace (4, 13, combustion chamber), for the purpose of recovering energy. It would have been obvious to one of ordinary skill in the art to modify WO 92/18690 by including at least a portion of the … of the cavity walls is formed of the … of the at least one of the walls of the boiler as taught by Engstrom for the purpose of recovering energy to provide for

a more efficient system. The applicant is using the known technique of providing for a common wall between the combustion chamber and the boiler to improve similar devices in the same way. WO 92/18690 in view of Engstrom (4676177)discloses the claimed invention except for the cooling fluid in the superheater is heated to a temperature no greater than 520 C, , and wherein the fluid in the superheater is heated to a temperature no greater than 520°C and the fluid in the heat exchanger is heated to a temperature in a range of 500°C to 600°C, and wherein the fluid in the superheater is heated to a temperature in a range of 480°C to 5200 C and the fluid in the heat exchanger is heated to a temperature in a range of 500°C to 600°C. It would have been obvious to one of ordinary skill in the art at the time the invention was made to the cooling fluid in the superheater is heated to a temperature no greater than 520 C, passing fluid from the superheater in the gas passage of the boiler to a heat exchanger in the cavity, and wherein the fluid in the superheater is heated to a temperature no greater than 520°C and the fluid in the heat exchanger is heated to a temperature in a range of 500°C to 600°C, and wherein the fluid in the superheater is heated to a temperature in a range of 480°C to 5200 C and the fluid in the heat exchanger is heated to a temperature in a range of 500°C to 600°C, since it has been held that the where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Claims 5, 7, 9-12, 14, 15, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamm (2606103) in view of Engstrom (4676177). Hamm shows a boiler further comprising a water or steam circulation system having superheaters and a furnace for recovering energy and chemicals from spent liquor combusted in the furnace (10, A, fig. 1); walls of the boiler further comprising a plurality of water cooled tubes in fluid communication with the water or

steam circulation system, water cooled tubes, (1, fig. 1); at least one cavity separate from the boiler, said cavity having cavity walls formed of water cooled tubes in fluid communication with the water cooled tubes in at least one of the walls of the boiler and the water or steam circulation system (16, 17, 27, 10, fig. 1); a fuel combustor arranged in the at least one cavity (14, fig. 1); at least one outlet for discharging combustion gases from the cavity to the boiler (fig. 1), and an interior of the at least one cavity having a cavity heat exchanger for superheating steam generated by superheaters in the boiler (15, fig. 1), a part of the walls of the at least one cavity is formed of the water cooled tubes of the boiler (16, fig. 2), the at least one cavity is located on a front wall of the boiler, and the front wall is the at least one of the walls of the boiler3 (fig. 1), the at least one outlet for the cavity is connected to the boiler and provides a conduit for combustion gases from the at least one cavity to be discharged immediately upstream of the superheaters of the boiler (fig. 1), a boiler further comprising at least one wall defining a furnace (fig. 1), at least one liquor injector arranged to inject liquor into the furnace (2, fig. 1), and at least one superheater arranged in a flue gas passage for combustion gases generated in the furnace (10, fig. 1), a plurality of water cooled tubes arranged in the at least one wall defining the furnace (fig. 1); at least one cavity separate from the furnace and having walls formed of water cooled tubes (fig. 2), wherein fluid flowing through at least one of the water cooled tubes of the wall defining the furnace (10) flows through the water cooled tubes of the cavity (17) and to the at least one superheater (16, fig. 1); a fuel combustor arranged in the at least one cavity (14, fig. 1); at least one outlet of the cavity for discharging combustion gases from the cavity to the boiler (fig. 1), and an interior of the at least one cavity being provided with a heat exchanger which receives superheated steam from the at least one superheater (10, 27, 17, 16, fig. 1), the liquor

injector discharges spent liquor into the furnace (2, fig. 1), the at least one superheater is a plurality of superheaters arranged in a flue gas stream of the boiler (10, fig. 1), a part of the walls of the at least one cavity is formed of the water cooled tubes of the walls of the boiler (16, fig. 1), the at least one cavity is located on a front wall of the boiler (fig. 1), the at least one outlet for combustion gases is connected to the boiler and provides a conduit for combustion gases from the at least one cavity to be discharged immediately upstream of the superheaters of the boiler (fig. 1), the cavity is adjacent an outside surface of the at least one wall of the furnace (fig. 1), injecting spent liquor in the furnace to generate hot combustion flue gases in the furnace (2, fig. 1), cooling the at least one wall of the furnace by flowing cooling fluid through the wall (1, fig. 1), generating hot combustion gases in the cavity (fig. 1); cooling a cavity wall of the cavity by flowing the cooling fluid from the at least one wall of the furnace through the cavity wall (fig. 1); and passing cooling fluid from the wall of the cavity to a superheater arranged in a flue gas passage of the boiler (10, 27, 17, 16, fig. 1), the hot combustion gases in the cavity are discharged into the boiler upstream of the superheater (fig. 1), comprising passing fluid from the superheater in the gas passage of the boiler to a heat exchanger in the cavity (10, 27, 17, 16, fig. 1), the cooling fluid flows vertically upward through the wall of the furnace and then to the cavity (fig. 1), passing fluid from the superheater in the gas passage of the boiler to a heat exchanger in the cavity (fig. 1). Engstrom teaches at least a portion of the at least one of the … of the cavity are formed of at least one of the … of the walls of the boiler, the cavity wall … is at least partially formed of the at least one wall of the furnace (4, 13, combustion chamber), a gasifier (1) for gasifying biomass material and said gasifier produces combustion gas provided to the fuel combustor of the cavity (combustion chamber) for the purpose of recovering

energy. It would have been obvious to one of ordinary skill in the art to modify Hamm (2606103) by including at least a portion of the … of the cavity walls is formed of the … of the at least one of the walls of the boiler, a gasifier for gasifying biomass material and said gasifier produces combustion gas provided to the fuel combustor of the cavity, the cavity wall … is at least partially formed of the wall of the boiler as taught by Hamm for the purpose of recovering energy to provide for a more efficient system. The applicant is using the known technique of providing for a common wall between the combustion chamber and the boiler to improve similar devices in the same way. Hamm in view of Engstrom discloses the claimed invention except for the cooling fluid in the superheater is heated to a temperature no greater than 520 C, and wherein the fluid in the superheater is heated to a temperature no greater than 520°C and the fluid in the heat exchanger is heated to a temperature in a range of 500°C to 600°C, and wherein the fluid in the superheater is heated to a temperature in a range of 480°C to 5200 C and the fluid in the heat exchanger is heated to a temperature in a range of 500°C to 600°C. It would have been obvious to one of ordinary skill in the art at the time the invention was made to the cooling fluid in the superheater is heated to a temperature no greater than 520 C, passing fluid from the superheater in the gas passage of the boiler to a heat exchanger in the cavity, and wherein the fluid in the superheater is heated to a temperature no greater than 520°C and the fluid in the heat exchanger is heated to a temperature in a range of 500°C to 600°C, and wherein the fluid in the superheater is heated to a temperature in a range of 480°C to 5200 C and the fluid in the heat exchanger is heated to a temperature in a range of 500°C to 600°C, since it has been held that the where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Claims 28- 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 92/18690 in view of Olausson (5454908). WO 92/18690 discloses injecting spent liquor in the furnace to generate hot combustion flue gases in the boiler (40, fig. 1), directing the flue gases through a flue gas passage of the furnace (fig. 1), generating hot combustion gases in the cavity; (fig. 1) , injecting the hot combustion gases from the cavity into the furnace at an opening in the furnace proximate to a narrow portion of the flue gas passage (line with arrow above 51), wherein the narrow portion is more narrow than an upstream portion of the furnace where the hot combustion flue gases are generated (fig.) , the injection of the hot combustion gases from the cavity mixes in the narrow portion with the flue gas in the flue gas passage ((This mixing will inherently occur when the combustion gases pass around superheating surface.), the narrow portion includes a bull nose section in a side wall of the flue gas passage and the hot combustion gases from the cavity are injected into an opening on a sidewall of the flue gas passage (fig.1), the injection of the hot combustion gases from the cavity shapes the flue gas (fig. 1). Olausson teaches as the flue gas flows past the narrow portion, opposite to the bull nose section, so as to flow over the narrow portion and into an expansion portion of the flue gas passage above the narrow portion, promoting selective non-catalytic reduction (SNCR) to bring the flue gases to a temperature suitable for SNCR (8, fig.) for the purpose of mixing. It would have been obvious to one of ordinary skill in the art to modify WO 92/18690 by including as the flue gas flows past the narrow portion, opposite to the bull nose section, so as to flow over the narrow portion and into an expansion portion of the flue gas passage above the narrow portion as taught by Olausson for the purpose of mixing. Locating the injection point as taught by Olausson to promote mixing and thus temperature change as the flue gas flows past the nose merely improves similar devices

in the same way as the gas will penetrate the flue gas better and provide for better mixing and temperature change when the cross section of the flue gas passage is reduced at the nose.

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 92/18690 in view of Olausson. WO 92/18690 discloses a boiler including walls defining a furnace and a flue gas passage (fig. 1), at least one liquor injector (40) arranged to inject liquor into the furnace, and at least one superheater (15) arranged in the flue gas passage for combustion gases generated in the furnace and flowing through the flue gas passage ; water cooled tubes arranged in at least one of the walls defining the furnace (page 13, lines 27-30); a combustion cavity (22)separate from the furnace and having a cavity wall formed of water cooled tubes (72); a fuel combustor arranged in the at least one cavity (end of 62); a cavity combustion gas outlet discharging combustion gases from the cavity to the boiler (arrow above 51), wherein the combustion gas outlet is proximate a narrow section of the flue gas passage and the combustion gases from the cavity mix in the narrow section with flue gases passing through the narrow section (This mixing will inherently occur when the combustion gases pass around superheating surface.), the narrow section is a bull nose section of the flue gas passage and the combustion gas outlet is at an elevation (fig. 1), A method of supherheating steam in a recovery boiler having at least one wall defining a furnace (fig. 1)and a separate combustion cavity (22) having a cavity wall formed of water cooled tubes (72), wherein the water cooled tubes are in fluid communication with water cooled tubes in the walls defining the furnace (51), said method comprising: a. injecting spent liquor (40) and air in the furnace to generate hot combustion flue gases in the boiler; b. generating hot combustion gases in the cavity (22), c. injecting the hot combustion gases from the cavity into the furnace (arrow above 51), the hot combustion gases from the cavity are

injected, the hot combustion gases from the cavity are discharged (arrow above 51), the hot combustion gases from the cavity are mixed with the air from step (a) (This will inherently occur). Olausson teaches at an elevation substantially the same as an elevation of the bull nose section, for shaping a flow pattern of flue gases in the boiler to improve mixing, through vertically located ports in the walls defining the furnace, for shaping a flow pattern of the flue gases in the furnace (8, fig.) for the purpose of mixing. It would have been obvious to one of ordinary skill in the art to modify WO 92/18690 by including at an elevation substantially the same as an elevation of the bull nose, section, for shaping a flow pattern of flue gases in the boiler to improve mixing, through vertically located ports in the walls defining the furnace, for shaping a flow pattern of the flue gases in the furnace as taught by Olausson for the purpose of mixing. Locating the injection point as taught by Olausson to promote mixing and thus temperature change as the flue gas flows past the nose merely improves similar devices in the same way as the gas will penetrate the flue gas better and provide for better mixing and temperature change when the cross section of the flue gas passage is reduced at the nose.

Claims 28- 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ham in view of Olausson (5454908). Ham discloses injecting spent liquor in the furnace to generate hot combustion flue gases in the boiler (2, fig. 1), directing the flue gases through a flue gas passage of the furnace (fig. 1), generating hot combustion gases in the cavity; (fig. 1), injecting the hot combustion gases from the cavity into the furnace at an opening in the furnace (fig. 1) , the injection of the hot combustion gases from the cavity mixes with the flue gas in the flue gas passage (This inherently occurs), the hot combustion gases from the cavity are injected into an opening on a sidewall of the flue gas passage (fig.1), the injection of the hot combustion gases

from the cavity shapes the flue gas (fig. 1). Olausson teaches proximate to a narrow portion of the flue gas passage, the narrow portion includes a bull nose section in a side wall of the flue gas passage and, as the flue gas flows past the narrow portion, opposite to the bull nose section, so as to flow over the narrow portion and into an expansion portion of the flue gas passage above the narrow portion, promoting selective non-catalytic reduction (SNCR) to bring the flue gases to a temperature suitable for SNCR (8, fig.), in the narrow portion, wherein the narrow portion is more narrow than an upstream portion of the furnace where the hot combustion flue gases are generated (5, fig.) for the purpose of mixing and for the purpose of drawing the gases. It would have been obvious to one of ordinary skill in the art to modify Ham by including proximate to a narrow portion of the flue gas passage, the narrow portion includes a bull nose section in a side wall of the flue gas passage and as the flue gas flows past the narrow portion, opposite to the bull nose section, so as to flow over the narrow portion and into an expansion portion of the flue gas passage above the narrow portion, promoting selective non-catalytic reduction (SNCR) to bring the flue gases to a temperature suitable for SNCR, in the narrow portion, wherein the narrow portion is more narrow than an upstream portion of the furnace where the hot combustion flue gases are generated as taught by Olausson for the purpose of mixing. Locating the injection point as taught by Olausson to promote mixing and thus temperature change as the flue gas flows past the nose merely improves similar devices in the same way as the gas will penetrate the flue gas better and provide for better mixing and temperature change when the cross section of the flue gas passage is reduced at the nose.

Claim 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ham in view of Olausson. Ham discloses a boiler including walls defining a furnace and a flue gas passage

(fig. 1), at least one liquor injector (2) arranged to inject liquor into the furnace, and at least one superheater (fig.) arranged in the flue gas passage for combustion gases generated in the furnace and flowing through the flue gas passage ; water cooled tubes arranged in at least one of the walls defining the furnace (1); a combustion cavity (fig. 1)separate from the furnace and having a cavity wall formed of water cooled tubes (16); a fuel combustor arranged in the at least one cavity (14); a cavity combustion gas outlet discharging combustion gases from the cavity to the boiler (fig.), wherein the combustion gas outlet … and the combustion gases from the cavity mix in … with flue gases passing through (This mixing will inherently occur.), the combustion gas outlet is at an elevation (fig. 1), A method of supherheating steam in a recovery boiler having at least one wall defining a furnace (fig. 1)and a separate combustion cavity (14) having a cavity wall formed of water cooled tubes (16), wherein the water cooled tubes are in fluid communication with water cooled tubes in the walls defining the furnace (28), said method comprising: a. injecting spent liquor (2) and air (5) in the furnace to generate hot combustion flue gases in the boiler; b. generating hot combustion gases in the cavity (14), c. injecting the hot combustion gases from the cavity into the furnace (fig. 1), the hot combustion gases from the cavity are injected, the hot combustion gases from the cavity are discharged (fig. 1), the hot combustion gases from the cavity are mixed with the air from step (a) (This will inherently occur), the water cooled tubes of the cavity wall are in fluid communication with the water cooled tubes in the walls defining the furnace (2728, 16), and the system including: a superheater (1) in the furnace generating superheated steam, and a cavity heat exchanger (16) receiving superheated steam from the superheaters in the furnace. Olausson teaches is proximate a narrow section of the flue gas passage, the narrow section, the narrow section is a bull nose section of

the flue gas passage and , at an elevation substantially the same as an elevation of the bull nose section, for shaping a flow pattern of flue gases in the boiler to improve mixing, through vertically located ports in the walls defining the furnace, for shaping a flow pattern of the flue gases in the furnace (8, fig.) for the purpose of mixing. It would have been obvious to one of ordinary skill in the art to modify Ham by including is proximate a narrow section of the flue gas passage, the narrow section, the narrow section is a bull nose section of the flue gas passage and , at an elevation substantially the same as an elevation of the bull nose section, for shaping a flow pattern of flue gases in the boiler to improve mixing, through vertically located ports in the walls defining the furnace, for shaping a flow pattern of the flue gases in the furnace as taught by Olausson for the purpose of mixing. Locating the injection point as taught by Olausson to promote mixing and thus temperature change as the flue gas flows past the nose merely improves similar devices in the same way as the gas will penetrate the flue gas better and provide for better mixing and temperature change when the cross section of the flue gas passage is reduced at the nose.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth B. Rinehart whose telephone number is 571-272-4881. The examiner can normally be reached on 7:10 -4:10.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven McAllister can be reached on 571-272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kbr

/Kenneth B Rinehart/
Primary Examiner, Art Unit 3749